

VIEWS FROM THE WATERSHED

Summer, 2021

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Chairman's Column by Stephen Williams

Did you miss it? World Soil Day – December 5, 2020. For those of us who spend every day assessing the vegetative conditions above ground I suggest it is what occurs below the soil surface that merits more of our attention. Healthy soil is a living ecosystem. Geology is sand, clay and silt – dirt, in other words. Dirt becomes soil not simply because there is enough organic matter in the soil, but because there is life in the soil. And not just any life but the full spectrum of soil biology.

One of the biggest challenges we face in the 21st century is the growing disconnect between people and the land. Very few people understand and appreciate that soil is an ecosystem. New Zealand agroecologist and soil scientist, Nicole Masters, and author of FOR THE LOVE OF SOIL, created a company called Integrity Soil. In her book she points out when most people argue for biodiversity, very few consider that most of the biodiversity is microbial and located under our feet. She reminds us that soil is the most important and essential ecosystem, linked to every other function on the planet. She speaks of the “microbial herd” populating soil and the six major classes of soil “livestock” in a healthy soil: viruses, bacteria and archaea (single cell organisms), fungi, protists (microscopic organisms grouped by the presence of a nucleus and membrane), nematodes (non-segmented worms), micro-arthropods and micro-animals (micro bugs – insects, centipedes, mites, spiders).

How is the microbial herd fed? The process of photosynthesis creates sugars, which are delivered to the soil via plant root exudates. In advanced grass species over half of the valuable sugars from the photosynthetic process end up being released out of the roots.

The mycorrhizae are root fungi, which live in and on plant roots. Their hyphae are much finer and can travel much further than plant roots, increasing the surface for water and nutrient uptake up to forty times. They are a significant component of a healthy soil ecosystem, making up as much as one third of microbial biomass in soil.

Mycorrhizae are a vital part of the water story, providing drought protection for most plant species. With their fine hyphae, they can probe deep inside the soil crumbs accessing pools of water unavailable to plants with their thicker, shorter root hairs. Fungi also absorb water when there is adequate soil moisture, which they slowly release periods of drought. Fungi can also make water! As they decompose carbon materials up to 20% of the volume is converted into water.

Gabe Brown, a farmer and stockman from North Dakota, in his book DIRT TO SOIL, warns us that without healthy soil we cannot have healthy crops, animals or people. Like humans, nature can handle occasional stress, but like humans, nature cannot function properly

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in the face of prolonged or acute stress. Mr. Brown champions the five Principles of Soil Health as follows:

Limit disturbance. Widespread tillage destroys soil structure and function by destroying soil aggregates, significantly decreases water infiltration rates, and accelerates the breakdown of organic material.

Armor (Cover) the soil surface. Plants that armor (cover) the soil buffer temperature fluctuations of the soil to benefit plants and soil biology.

Build diversity. Plant health, function and biomass improve and increase with diversity because a diverse plant population provides a much more diverse diet of root exudates for the soil microbes.

Keep living roots in the soil. The only way to increase water holding capacity in the soil is to increase organic matter. The living roots in the soil feed soil biology and help cycle nutrients, as well as enhance mycorrhizal fungi.

Integrate animals. The best proven way to transfer massive amounts of carbon dioxide out of the atmosphere and into the soil is by maintaining a landscape that includes well managed grazing animals.

You will recall that the September, 2020 edition of the Arizona Association of Conservation Districts Newsletter had an article in the Conservation Corner section entitled “5 Principles of Soil Health”. These differ from those described by Gabe Brown, but are equally important to consider for our agricultural operators.

If you want to explore the fascinating and critically important role of soil health in sustaining our crop and animal productivity, and our overall livelihoods, I suggest the books listed below. They will make you “think outside the box”.

DIRT TO SOIL, Gabe Brown

FOR THE LOVE OF SOIL, Nicole Masters

CALL OF THE REED WARBLER, Charles Massey

As for the Santa Cruz NRCB business, it looks as though 2021 will bring us more telephonic Board meetings, Zoom workshops and possibly no field days at the Santa Fe Ranch for Nogales and Rio Rico grade school students. Until Covid cases subside substantially face to face meetings will not be possible. Continued on Page 2

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The Santa Cruz NRCD will keep its Cooperators advised of important information via email and newsletters. Until next issue, stay healthy and safe.

Stephen Williams, Chairman

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Nutrition Considerations for Livestock During Drought **Ashley Wright, Livestock Area Agent, University of Arizona Cooperative Extension**

Arizona is no stranger to drought, and those grazing livestock on public lands are well aware of the impacts to the landscapes they steward, as well as their operations. Drought has two main effects on the forage in the landscape: It decrease forage quantity, but also has a big impact on forage quality. Providing nutritional support to grazing livestock during drought can help producers offset or prevent losses, as well as preserve forage resources on the landscape for wildlife and replenishment when the rains return.

Supplemental feeding for cattle can be split into two main categories: Protein supplements and Energy supplements. Protein supplements are, as their name suggests, high in protein, usually at least 22%. Energy supplements, on the other hand, just provide calories (or “groceries”), usually this takes the form of purchasing and feeding hay. The choice between the two is determined by the situation your operation finds itself in when drought hits. Do you have forage resources to spare, they’re just low quality forages such as ungrazed forages from previous years in rested pastures? Or do you have very few forage resources and scarcity of feed is the main problem?

If you are in the first category and are fortunate enough to have some forage resources to fall back on, protein supplementation can help your cattle better utilize those resources. Protein supplements are generally provided as a tub, block, or lick for convenience in providing them to grazing animals. These types of supplements are not meant to replace forage consumption, but enhance the cow’s ability to use it. As protein levels in forages drop below 6.25% (as they typically do during the winter months even in non-drought years), the microbiome of bacteria in the rumen reduce in number and become less active. This decreases the cow’s ability to consume and process forages. Cattle fed a protein supplement of at least 22% see significant increases in rumen activity and are able to consume higher quantities of low quality forage (up to a 49% increase in consumption has been reported in cattle fed a 33% protein supplement). The benefit to this type of supplement is they don’t need to be fed daily (although the blocks, licks, or tubs can be left out for cattle to consume at will), they can be fed as infrequently as once per week at 7x the daily rate. This significantly reduces labor associated with protein supplementation.

If lack of forage resources is the major problem, energy supplementation in the form of hay or perhaps hay and some grain concentrate could be the answer. Generally, this type of feed can be cheaper than protein supplementation (although in drought years the price often increases), but unlike supplementing with protein, energy supplements must be provided daily. Also unlike protein supplementation, cattle will consume less forages (not more) when energy supplements are provided, although this could be a positive factor if preserving landscape forage is the goal. Note that some land management agencies don’t allow feeding hay, and cattle may need to be moved to another land type. Energy supplementation can also be used in conjunction with protein supplement, this is especially helpful if poor quality hay is what you have available.

Finally, either of these feeding scenarios should be combined with a strategic culling plan to remove nonproductive animals from the herd. If culling is accomplished earlier in drought rather than later, the overall impacts to the herd may be less. A high quality mineral supplement can also help cattle make the best of the forages available to them during this time.

SCNRCD Cooperator Named Range Manager of the Year

At its Winter meeting on February 4, 2021, the Arizona Section of the Society for Range Management named Santa Cruz NRCO Cooperator, Bill Brake, Range Manager of the Year. Mr. Brake is the resident owner and manager of the Rose Tree Ranch in Elgin. Mr. Brake is a University of Arizona range management graduate who has owned the Rose Tree Ranch since 1999. He runs a red and black Angus commercial cow/calf operation on 9,700 acres of private, Bureau of Land Management and Arizona State Trust land.

During his 21 years on the ranch Mr. Brake has initiated the preparation of a Coordinated Resource Management Plan with the Natural Resources Conservation Service, Bureau of Land Management, Arizona State Land Department, University of Arizona Cooperative Extension, Arizona Game and Fish Department and Santa Cruz Natural Resource Conservation District. This CRM Plan outlines the ranch's deferred rest rotation grazing system. 10 rain gauges spread across the ranch, and annual vegetation monitoring of the key forage plants on 6 Key Areas, help inform yearly grazing management decisions. Rangeland monitoring has demonstrated that overall rangeland conditions have improved during the 21 years of Mr. Brake's stewardship.

The most telling fact about the Rose Tree Ranch is that when Mr. Brake bought the ranch in 1999 it had only 5 pastures. Now, 21 years later, it has 27 pastures. This change has provided tremendous flexibility to the grazing program by allowing tighter control over the timing, intensity and duration of livestock grazing in each pasture. Livestock and wildlife have benefited from Mr. Brake's management and stewardship of the ranch's natural resources.

Congressional Border Tour and Dinner at the Bell Ranch



Nine Congressman and their staff toured Arizona-Mexico border. Organized by Arizona Congressman Andy Biggs, the delegation included Glenn Grothman (Wisconsin), Warren Davidson and Bob Gibbs (Ohio), Andrew Clyde (Georgia), Bob Good (Virginia), Lauren Boebert (Colorado), Matt Rosendale (Montana), and Barry Moore (Alabama).

On January 28, 2021, the Pima and Santa Cruz NRCs hosted a border tour at Dan Bell's and Jim Chilton's ranches and dinner at the Bell Ranch. During the tour, the delegation saw the unfinished border wall gaps, unfinished roads, idled construction materials and equipment, inadequate border fencing (4-strand barb wire), and the rough, mountainous terrain. After the tour, the delegation attended a BBQ dinner at the Bell ranch. During the dinner, Jim Chilton & Cindy Coping (Pima NRC) and Dan Bell and Bill Schock (Santa Cruz NRC) gave presentations. They talked about the challenges living in the border area. Overall, ranchers along the U.S.-Mexico border say they are concerned for their personal safety, environmental damage, and the safety of their property. See links below for .

<https://www.dailysignal.com/2021/02/08/with-work-stopped-7-things-i-saw-at-border-wall/>

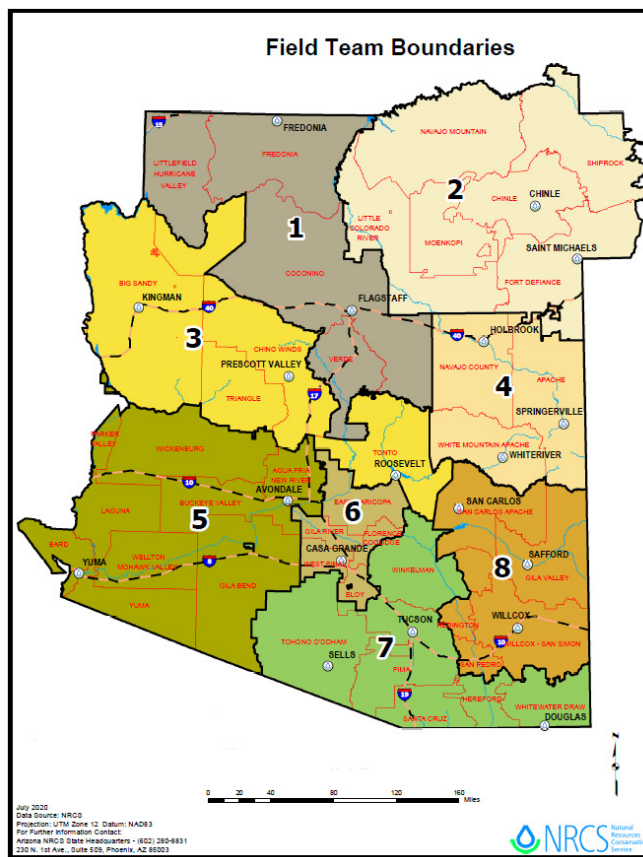
<https://www.dailysignal.com/2021/02/11/arizona-rep-andy-biggs-shares-what-the-us-mexico-border-is-like-now/>

For Arizona Association of Conservation Districts information, click on their Newsletter Link:
<https://www.aacd1944.com/enewsletter/>

NRCS Update

LOCAL WORKGROUP MEETING (LWG): Local Workgroup Meeting requirements need to be gathered by July 30th this year. In place of a meeting, it was suggested to have a questionnaire/survey sent out. After the results are compiled, a teleconference will be conducted to discuss the results and any other concerns or questions.

FIELD OFFICE OPERATIONS & MANAGEMENT: In February, Tom Reis was selected as the new Supervisory Natural Resources Specialist (Team Lead) for AZ NRCS Team 7. Team 7 consists of the Tucson Field Office, Douglas Field Office and Sells Field Office. Tom will be supervising all 3 offices and will have his home office based out of the Tucson Field Office location. Per the map



Current Tucson Field Office Staffing

Tom Reis, Supervisory Natural Resources Specialist – Team Lead
Emilio Carrillo, Rangeland Management Specialist – Master Planner
Dave Womack, Rangeland Management Specialist – Master Planner
Alisha Phipps, Rangeland Management Specialist
Brett Myers, Rangeland Management Specialist
Alvaro Campos, Soil Conservationist

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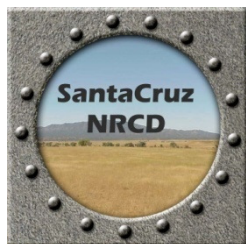
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Draft Resolutions. To be discussed & voted on during the AACD Summer Conference:

- Conservation Easements: Conservation or Agricultural easements are a means of preserving agricultural use of land, on condition of appropriate compensation to and voluntary agreement of the property owner. AACD recognizes the value of agricultural land for maintaining the long-term viability and sustainability of natural resources.
- Opposing the Federal Government's "30 X 30" Land Preservation Goal: The Board opposes the 30 x 30 program, including its objective of permanently preserving 30 percent of the Nation's lands in its natural state by 2030, or any similar program that will set aside and prevent the productive use of millions of acres of our lands.
- OFF HIGHWAY VEHICLE (OHV) MITIGATION: Trespass of OHVs result in substantial ecological harm including contamination of natural waters, trashing of forests, wildfire and harassment of wildlife and livestock; as well as extensive property damage including access roads, fences, gates, water tanks, drinkers and stock tanks.

Calendar of Activities/Events

- July 8-9 Arizona Women In Agriculture Conference, Wigwam Resort, Litchfield Park, AZ
- July 16-18 Arizona Cattlemen's Association Summer Convention, Springerville, AZ
- August 9-11 AACD Summer Conference
- August 11-13 Arizona Section of the Society for Range Management Summer Meeting, Prescott, AZ
- NRCWAY Summer Camp has been cancelled for this year with plans of reopening next year.



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